

- a pan-shaped housing having a bottom and two spaced side walls connecting a storage end wall to a discharge end wall, the housing defining an upwardly open litter chamber to be filled to a given fill level with cat litter;
- a comb path extending from the storage end wall to the discharge end wall;⁵
- a comb extending between the side walls; and
- a comb drive for driving the comb along the comb path from a storage position adjacent the storage end wall to a discharge position adjacent the discharge end wall¹⁰ and back to the storage position, the comb projecting down into the litter chamber to a level below the fill level and near the housing bottom while the comb moves toward the discharge end wall so that the comb engages any clumps in the litter and carries such¹⁵ clumps to the discharge position;
- the improvement comprising:
- a cat exit sensor for sensing exit of a cat from the litter chamber;
- delay means, connected to the cat exit sensor and to the²⁰ comb drive, for actuating the comb drive to drive the comb from the storage position to the discharge position and back to the storage position at a predetermined time subsequent to sensing of exit of a cat from the litter chamber and²⁵
- a litter level sensor for sensing an insufficient quantity of litter in the litter chamber, below the given fill level.
2. An improved cat litter box according to claim 1, and further comprising:
- a waste receptacle located outside of the litter chamber³⁰ adjacent to the discharge end wall; and
- deflection means, on the comb path, for deflecting the comb to deposit clumps carried by the comb into the waste receptacle.
3. An improved cat litter box according to claim 2 in which:³⁵
- the waste receptacle includes a base pan and a cover hinged to the base pan; and
- the deflection means raises the cover of the waste receptacle to enable deposit of clumps in the base pan, of the⁴⁰ waste receptacle.
4. An improved cat litter box according to claim 2 in which the waste receptacle comprises:
- a base pan for receiving and storing cat waste from the litter box;⁴⁵
- a cover hinged to and normally covering the base pan; and
- guide means, on the cover, engageable by the deflection means of the litter box to raise the cover to an open position.⁵⁰
5. An improved cat litter box according to claim 1 in which the cat exit sensor comprises:
- radiation source, mounted adjacent one side of the litter chamber, the radiation source producing a beam that projects across the litter chamber above the fill level;⁵⁵ and
- a detector mounted adjacent the other side of the litter chamber in position to intercept the beam from the radiation source.
6. An improved cat litter box according to claim 5 in which:⁶⁰
- the radiation source is a light source and the beam is a light beam;
- the detector is a photodetector; and
- the light source and the photodetector are mounted on opposite side walls of the litter chamber.⁶⁵

7. An improved cat litter box according to claim 1 in which the litter level sensor comprises:

a radiation source, mounted adjacent one side of the litter chamber, the radiation source producing a beam that projects across the litter chamber below the fill level; and

a detector mounted adjacent the other side of the litter chamber in position to intercept the beam from the radiation source.

8. In an improved self-cleaning cat litter box including:

a pan-shaped housing having a bottom and two spaced side walls connecting a storage end wall to a discharge end wall, the housing defining an upwardly open litter chamber to be filled to a given fill level with cat litter;

15 a comb path extending from the storage end wall to the discharge end wall;

a comb extending between the side walls; and

20 a comb drive for driving the comb along the comb path from a storage position adjacent the storage end wall to a discharge position adjacent the discharge end wall and back to the storage position, the comb projecting down into the litter chamber to a level below the fill level and near the housing bottom while the comb

25 moves toward the discharge end wall so that the comb engages any clumps in the litter and carries such clumps to the discharge position;
the improved construction comprising:

30 a track member, defining the comb path, mounted on one side wall above the fill level;

a carriage supporting the comb;

35 a guide wheel mounted on the carriage and engaging the track member;

and a reversible drive motor, comprising a part of the comb drive, mounted on the carriage.

9. An improved cat litter box according to claim 8, in which the carriage includes a comb shaft extending across the litter chamber from one side wall to the other, and further comprising:

40 a second track member mounted on the other side wall above the fill level; and

a second guide wheel mounted on the carriage and engaging the second track member.

45 10. An improved cat litter box according to claim 9 in which:

each track member has a multiplicity of equally spaced perforations along the track;

50 and further comprising:

a first drive wheel mounted on one end of the comb shaft and having a plurality of radial drive pins engageable in the perforations of the first track member; and

55 a second drive wheel mounted on the other end of the comb shaft and having a plurality of radial drive pins engageable in the perforations of the second track member.

60 11. An improved cat litter box according to claim 10 in which the drive means comprises a gear train connecting the motor to the comb shaft to rotate the comb shaft.

65 12. An improved cat litter box according to claim 11 in which each track member includes an upwardly inclined extension at its opposite ends so that the comb is directed upwardly above the fill level at both ends of the litter chamber.

13. An improved cat litter box according to claim 8 and further comprising:

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a cat exit sensor for sensing exit of a cat from the litter chamber; and

delay means, connected to the sensor and to the reversible motor, for actuating the comb drive motor to drive the comb from the storage position to the discharge position at a predetermined time interval subsequent to sensing of exit of a cat from the litter chamber.

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14. An improved cat litter box according to claim 13, and further comprising:

a waste receptacle located outside of the litter chamber adjacent to the discharge end wall; and

deflection means, on the comb path, for deflecting the comb to deposit clumps carried by the comb into the waste receptacle.

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15. An improved cat litter box according to claim 14 in which:

the waste receptacle includes a base pan and a cover hinged to the base pan; and

the deflection means raises the cover of the waste receptacle to enable deposit of clumps in the base pan of the waste receptacle.

16. An improved cat litter box according to claim 13 in which the cat exit sensor comprises:

a radiation source, mounted adjacent one side of the litter chamber, the radiation source producing a beam that projects across the litter chamber above the fill level; and

a detector mounted adjacent the other side of the litter chamber in position to intercept the beam from the radiation source.

17. An improved cat litter box according to claim 16 in which:

the radiation source is a light source and the beam is a light beam;

the detector is a photodetector; and

the light source and the photodetector are mounted on opposite side walls of the litter chamber.

18. An improved cat litter box according to claim 8 and further comprising:

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a litter level sensor for sensing an insufficient quantity of litter in the litter chamber, below the given fill level.

19. An improved cat litter box according to claim 18 in which the litter level sensor comprises:

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a radiation source mounted adjacent one side of the litter chamber, the radiation source producing a beam that projects across the latter chamber below the fill level; and

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a detector mounted adjacent the other side of the litter chamber in position to intercept the beam from the radiation source.

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20. In an improved self-cleaning cat litter box including:
a pan-shaped housing having a bottom and two spaced
side walls connecting a storage end wall to a discharge
end wall, the housing defining an upwardly open litter
chamber to be filled to a given fill level with cat litter;
5 a comb path extending from the storage end wall to the
discharge end wall;
a comb extending between the side walls;
10 a comb drive for driving the comb along the comb path
from a storage position adjacent the storage end wall to
a discharge position adjacent the discharge end wall
and back to the storage position, the comb projecting
down into the litter chamber to a level below the fill
15 level and near the housing bottom while the comb
moves toward the discharge end wall so that the comb
engages any waste clumps in the litter and carries such
waste clumps to the discharge position; and
a waste receptacle located outside of the litter chamber
20 adjacent to the discharge end wall, for receiving waste
carried to the discharge end of the litter box by the
comb;
the improved construction comprising:
a waste receptacle sensor for sensing filling of the
25 waste receptacle;
an excess waste alarm actuated by the waste receptacle
sensor;
a litter level sensor for sensing an insufficient quantity of
litter in the litter chamber, below the given fill level;
30 and
an insufficient litter alarm actuated by the litter level
sensor.
21. An improved cat litter box according to claim 20 in
which the waste receptacle sensor comprises:
- 35 a radiation source, mounted on an extension of one side
wall beyond the discharge end wall, the radiation
source producing a beam that projects across the waste
receptacle; and
- 40 a detector, mounted on an extension of the other side wall
beyond the discharge end wall, positioned to intercept
the beam from the radiation source.
22. An improved cat litter box according to claim 20 in
which the litter level sensor comprises:
- 45 a radiation source, mounted adjacent one side of the litter
chamber, the radiation source producing a beam that
projects across the litter chamber below the fill level;
and
- 50 a detector mounted adjacent the other side of the litter
chamber in position to intercept the beam from the
radiation source.

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23. A self-cleaning cat litter box comprising:

a pan-shaped housing having two opposed sidewalls, the housing defining an upwardly open litter chamber to be filled to a given fill level with cat litter;

a comb extending between the two opposed sidewalls;

comb drive means for driving the comb between a storage position and a discharge position, the comb projecting down into the litter chamber to a level below the fill level while the comb moves toward the discharge position so that the comb engages clumps in the litter and moves such clumps toward the discharge position; and

litter supply sensor means for sensing an insufficient supply of litter in the litter chamber.

24. A self-cleaning cat litter box comprising:

a pan-shaped housing defining an upwardly open litter chamber to be filled to a given fill level with cat litter;

moving means disposed in the pan-shaped housing;

a carriage supporting the moving means; and

drive means for driving the moving means between a storage position and a discharge position, the moving means projecting down into the litter chamber to a level below the fill level while the moving means moves toward the discharge position so that the moving means engages clumps in the litter and moves such clumps toward the discharge position;

said drive means including motor means mounted on the carriage for driving the moving means between the storage position and the discharge position.

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25. The litter box of claim 24 wherein the motor means includes a reversible drive motor.

26. A self-cleaning cat litter box comprising:

a pan-shaped housing defining an upwardly open litter chamber to be filled to a given fill level with cat litter;

a waste receptacle located outside the litter chamber;

a comb disposed in the litter chamber;

comb drive means for driving the comb between a storage position and a discharge position, the comb projecting down into the litter chamber to a level below the fill level while the comb moves toward the discharge position so that the comb engages clumps in the litter and moves such clumps toward the discharge position; and

waste level sensor means for sensing when waste has reached a predetermined level in the receptacle.

27. A self-cleaning cat litter box comprising:

a pan-shaped housing defining an upwardly open litter chamber to be filled to a given fill level with cat litter;

a comb disposed in the litter chamber;

comb drive means for driving the comb between a storage position and a discharge position, the comb projecting down into the litter chamber to a level below the fill level while the comb moves toward the discharge position so that the comb engages clumps in the litter and moves such clumps toward the discharge position; and

mode selector means for selecting between at least a manual operation mode and an automatic operation mode.

28. A self-cleaning cat litter box comprising:

a pan-shaped housing having two opposed sidewalls, the housing defining an upwardly open litter chamber to be filled to a given fill level with cat litter;

a comb drive coupled to the housing;

a comb extending between the two opposed sidewalls and being coupled to the comb drive and movable between a storage position and a discharge position, the comb projecting down into the litter chamber to a level below the fill level so that the comb engages clumps in the litter and carries such clumps to the discharge position; and

a litter supply sensor coupled to the housing.

29. The litter box of claim 28 wherein the litter supply sensor is disposed to sense an insufficient supply of litter in the litter chamber.

30. The litter box of claim 29 wherein the litter supply sensor includes a radiation source mounted in the litter chamber and disposed to produce a beam that projects across the litter chamber and a detector mounted in the litter chamber to intercept the beam from the radiation source.

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31. A self-cleaning cat litter box comprising:

a pan-shaped housing defining an upwardly open litter chamber to be filled to a given fill level with cat litter;

a comb drive coupled to the housing;

a comb extending between two opposed sidewalls and being coupled to the comb drive and movable between a storage position and a discharge position, the comb projecting down into the litter chamber to a level below the fill level so that the comb engages clumps in the litter and moves such clumps toward the discharge position; and

a comb supporting carriage, said comb drive including a drive motor mounted on the carriage.

32. The litter box of claim 31 wherein the drive motor is reversible.

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33. A self-cleaning cat litter box comprising:

a pan-shaped housing defining an upwardly open litter chamber to be filled to a given fill level with cat litter;

a comb drive coupled to the housing;

a comb extending between two opposed sidewalls and being coupled to the comb drive and movable between a storage position and a discharge position, the comb projecting down into the litter chamber to a level below the fill level so that the comb engages clumps in the litter and moves such clumps toward the discharge position; and

a mode selector switch, the switch being moveable between a manual operation position wherein an operator causes the comb to move toward the discharge position and

an automatic operation position wherein the comb moves toward the discharge position automatically upon the occurrence of a predetermined event.

34. A self-cleaning cat litter box comprising:

a pan-shaped housing defining an upwardly open litter chamber to be filled to a given fill level with cat litter;

a waste receptacle located outside the litter chamber;

a comb disposed in the litter chamber;

comb drive means for driving the comb between a storage position and a discharge position, the comb projecting down into the litter chamber to a level below the fill level while the comb moves toward the discharge position so that the comb engages clumps in the litter and moves such clumps toward the discharge position; and

a waste level sensor coupled to the litter chamber.

35. The litter box of claim 34 further including an alarm coupled to the waste level sensor, the alarm being activated when the waste level sensor determines that waste in the waste receptacle has reached a predetermined level.

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36. A self-cleaning cat litter box comprising:

a pan-shaped housing having two opposed sidewalls, the housing defining an upwardly open litter chamber to be filled to a given fill level with cat litter;

a comb extending between the two opposed sidewalls; and

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comb drive means for driving the comb between a storage position and a discharge position, the comb projecting down into the litter chamber to a level below the fill level while the comb moves toward the discharge position so that the comb engages clumps in the litter and moves such clumps toward the discharge position, the comb being positioned above the fill level in the storage position and the discharge position.

37. A self-cleaning cat litter box comprising:

a housing defining an upwardly open litter chamber to be filled to a given fill level with cat litter;

a comb drive coupled to the housing;

a comb extending between the two opposed sidewalls and being coupled to the comb drive and movable between a storage position and a discharge position, the comb projecting down into the litter chamber to a level below the fill level so that the comb engages clumps in the litter and moves such clumps toward the discharge position and being positioned above the fill level in the storage position.

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